INNOVATIVE PROCUREMENT APPROACHES
WHAT REMAINS?

Parts approach requiring technical analysis

- Radiation levels, dominant effects, …
- Working temperature conditions: ranges and cycles
- Demanded technologies to achieve mission challenges,
- Identification of equipment – component criticality within the satellite
- Mission acceptance risk at different levels
- Component volumes, constellation size, recurrence, …
- Time frame
- Cost
WHY CHANGING?

The pressure of the market requires better performance at lower prices

Parts selection based on:
- New technologies
- Mass production
- Low cost
- Higher performance
- Low (no) heritage

The space industry is a slow adopter of new technologies
WHAT IS PROCUREMENT?

- Parts Engineering
- Procurement
- Testing
- Logistics
COLLABORATIVE APPROACH
SELECTION AND VALIDATION

Selection no longer as an individual analysis

Multiple sources | All required information in a single platform

| Unit price | Validation – Non recurrent cost | Granted reliability level | Manufacturer confidence status |
| Radiation level against mission requirement | Risk impact associated to device malfunction, at board, … |
SELECTION AND VALIDATION

Compare and find what better fits your needs
SELECTION AND VALIDATION

Get full control of your needs
SELECTION AND VALIDATION

All data in a single page
INNOVATION IN TESTING

Testing and validation based on a collaborative approach between suppliers and customers

1. DESIGN
   Design your tests over the web

2. CONDUCT
   Virtual Lab conducts your tests

3. EXPLORE
   Virtual Lab organizes your data into a smart data base

4. ANALYZE
   DOEEET crunches and analyzes data
VIRTUAL LAB

Test design using all available knowledge from EEE parts to specific application needs
WHAT IF NOT AVAILABLE?

Use of RT dice or commercial wafers (full traceability)

Why use plastic package over ceramic or metal?

- Smaller package footprint.
- Chip performance.
- Cost reduction.

Why QFN / BGA

- Very flexible, range of package sizes with same tool.
- Low cost to switch between packages / customise.
- Matches market requirements.
- Why not leaded packages? - dedicated tools per type.

Current Market Offering and Trends

- Plastic packaging centred in Asia.
- Difficult to access for low volumes.
- Plastic widely adopted in most markets.
- Emerging use in Space.
- APC and Sencio offer molding in NL, focussed on advanced packaging
PLASTIC PACKAGING

Can be beneficial for:

- Fast Prototyping
- Low volume production 1000 – 10,000 per lot.
- Space, custom assemblies not catered by OCM.
- Specialist applications – i.e. Ribbon, wedge, flip-chip.

With tailored testing approach based on mission and requirements.

Assumptions

- Package body size variations achieved with a new lead frame / substrate.
- Common 0.9mm thickness could be established as a first offering.
- NiPdAu/Ag pre-plated lead-frame
- Laser mark
- Design the mold to allow just a change of top plate to increase the depth.
TESTING

To perform complete lot procurement (even at wafer level), same date code and same wafer diffusion to avoid any variability and test complete lot to minimize test cost.

- Perform upscreening for extended temperature ranges -55°C up to +125°C or mission specifics.
- Perform post processing analysis using PAT (Process average testing) technics to eliminate outliers parts.
- Perform limited radiation test on key devices according to the mission profile and satellite lifetime.
- Perform functional safety analysis at system level (ISO 26262) FMEA/FMEACA (Failure Modes, Effects and Criticality Analysis) to determine critical devices.
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THANK YOU!